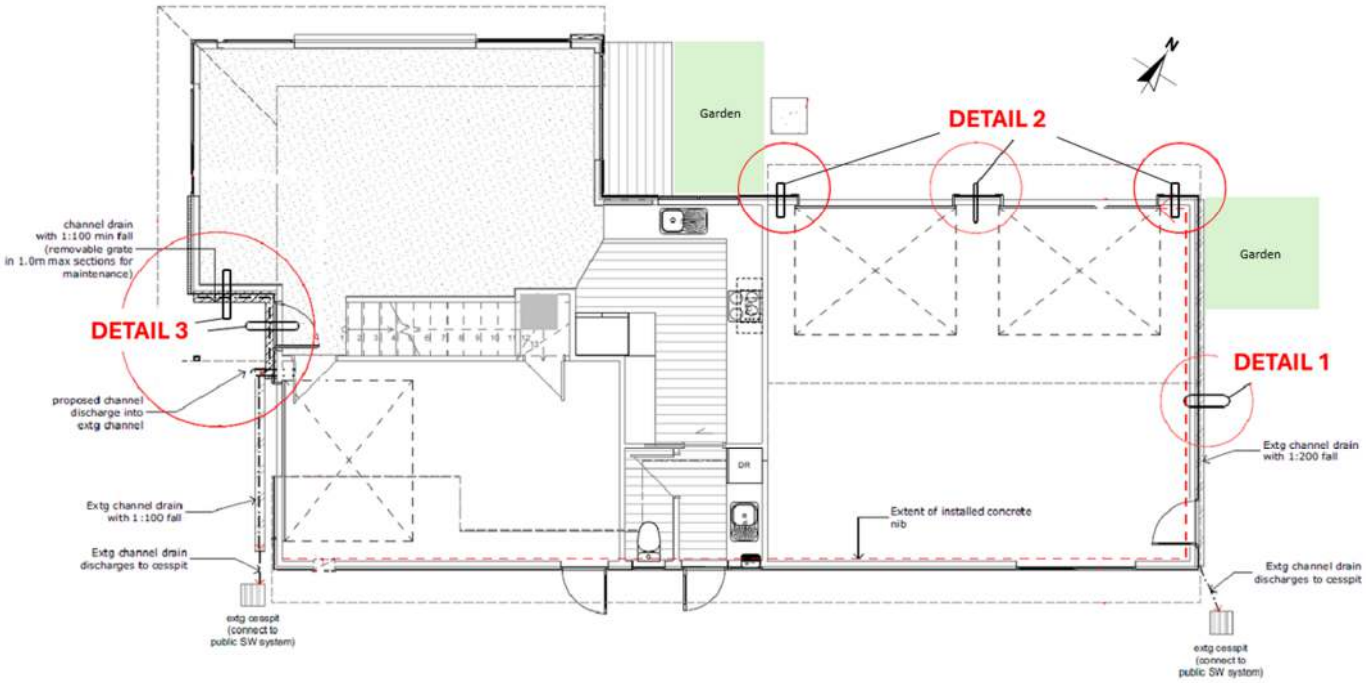
Determination 2025/049

The compliance of a replacement cladding system on a dwelling with clauses B2 and E2 of the Building Code

16A Marellen Drive, Red Beach, Auckland[1]

Summary

This determination considers compliance with E2 *External Moisture* and B2 *Durability* of three external cladding details that terminate above paved ground and channel drains. The determination discusses the system's components and features and the management of external moisture.



Plan 1: Floor plan with locations of details (not to scale)

[1] 16A Marellen Drive is the postal address for the property. However, the authority's property files record the address as 14 Marellen Drive. The parties have confirmed that both addresses apply to the property.

In this determination, unless otherwise stated, references to "sections" are to sections of the Building Act 2004 ("the Act") and references to "clauses" are to clauses in Schedule 1 ("the Building Code") of the Building Regulations 1992.

The Act and the Building Code are available at www.legislation.govt.nz. Information about the legislation, as well as past determinations, compliance documents (eg, Acceptable Solutions) and guidance issued by the Ministry, is available at www.building.govt.nz.

1. The matter to be determined

1.1. This is a determination made under due authorisation by me, Peta Hird, for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment ("the Ministry").[2]

1.2. The parties to the determination are:

1.2.1. B&S Custodians Ltd, the owner of the dwelling and property ("the owner")

1.2.2. Auckland Council, carrying out its duties as a territorial and building consent authority ("the authority")

1.2.3. T Wilson, the licensed building practitioner concerned with the design of the building work ("the designer")

1.2.4. M Hyland, the licensed building practitioner concerned with the construction of the building work ("the builder").

1.3. This determination arises from the authority's inspection of the building work to partially reclad the owner's dwelling, and it's view that three areas of the cladding did not comply with the building consent in relation to ground clearance. Following the inspection, the designer provided as-built and proposed details to the authority for assessment. The authority was of the view that this information was insufficient to establish that the details would comply with clauses E2 and B2 of the Building Code as alternative solutions.

1.4. The matter to be determined, in terms of section 177(1)(a), is whether the constructed and proposed building work described in three details comply with Clauses E2 External Moisture and B2 Durability. The three details are:

1.4.1. the as-built construction of the cladding system above a channel drain along the northeast elevation of the rear garage ("Detail 1")

1.4.2. the as-built construction of the cladding system above paved ground adjacent to the rear garage doors on the northwest elevation ("Detail 2")

[2] The Building Act 2004, section 185(1)(a) provides the Chief Executive of the Ministry with the power to make determinations.

1.4.3. the proposed cladding system terminating above a proposed replacement channel drain at the front entrance of the dwelling ("Detail 3").

1.5. The parties were invited to make submissions, with the designer (on behalf of the owner) being the only party that elected to do so. I have taken their submissions into account in making this determination.

1.6. This determination does not consider the authority's decisions in relation to the building consent or code compliance certificate, or it's refusal to accept the alternative solution proposal.[3]

2. The building work

2.1. The owner's property is in a residential area on the coast in north Auckland. The building work that is the subject of this determination involved the partial replacement of the external cladding on an existing dwelling with two internal garages. The work involved replacing direct-fixed horizontal timber weatherboards with vertical timber weatherboards installed over a cavity.

2.2. The replacement cladding system comprises acetylated timber weatherboards[4] installed vertically, H3.1-treated 45mm x 20mm timber castellated cavity battens installed horizontally, an H3.2-treated plywood rigid air barrier as the wall underlay, proprietary cavity closers, and stainless-steel fixings.

2.3. This determination is concerned with three details, with the issue in dispute being the termination of the cladding relative to the finished ground and channel drains below. Details 1 and 2 have been constructed on two elevations of the rear garage. Detail 3 is proposed for the external walls adjacent to the front entrance, above a channel drain that is proposed to be replaced. See Plan 1.

2.4. Figure 1 shows the as-built cladding detail for the northeast elevation of the rear garage (Detail 1). It comprises a concrete nib installed to raise the height of the timber bottom plate of the external wall to a minimum of 150mm above the finished ground level. Externally, there is an existing channel drain at the base of this nib and below the cladding system, covered with a grate. The weatherboards extend down past the top of the concrete nib, with a 20mm clearance between the

[3] I understand this process was similar to a minor variation request to the authority and was made on the recommendation of the authority.

[4] See paragraph 4.28 for an explanation of acetylated timber.

bottom of the cladding and the top of the channel drain grate. There are no eaves above the cladding in this location.

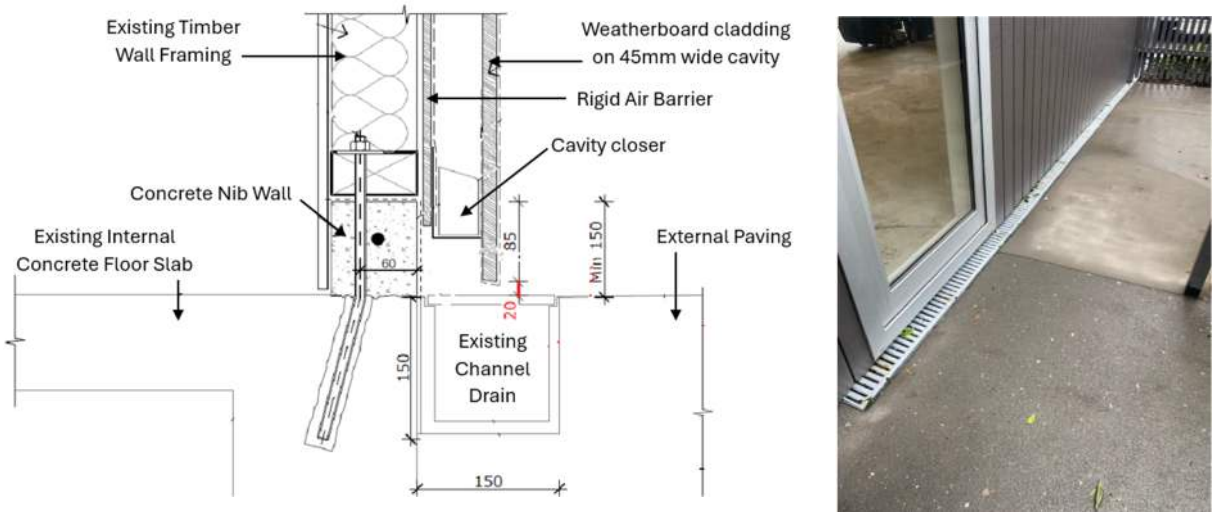


Figure 1: Detail 1 – as-built cladding detail (not to scale) and photo along northeast elevation of rear garage

2.5. Figure 2 shows the as-built detail to the northwest elevation of the rear garage (Detail 2). The cladding system in this area is adjacent to the rear garage doors, covers a maximum of 700mm lengths in three locations, is installed over a cavity, and extends down to within 15mm of the concrete paved driveway below. In this location, the bottom of the existing external wall framing is within 60mm of paved ground and there are 600mm eaves overhanging the external walls.

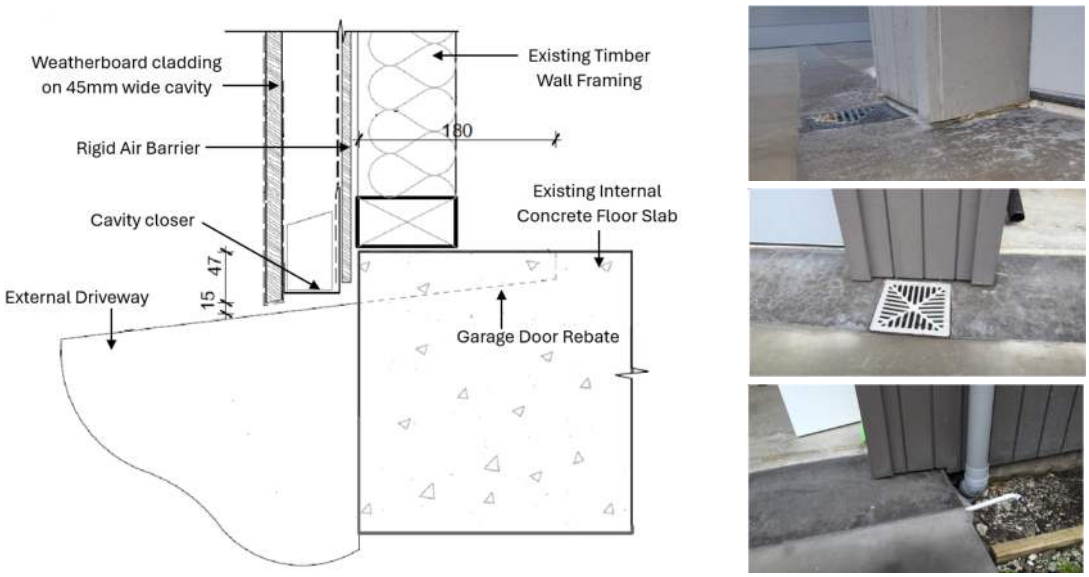


Figure 2: Detail 2 – as-built cladding detail (not to scale) and photos of northwest elevation of rear garage adjacent to doors

2.6. Figure 3 shows the proposed cladding detail for the southwest elevation of the dwelling adjacent to the front entrance (Detail 3). The cladding system is to be installed on two short wall elevations, with a new channel drain and grate (to replace an existing drain) connecting into an existing drain to dispose of any surface water collected. The cladding system is to extend down to within 15mm of the channel drain grate. In this area, a porch roof extends between 1.1m to 1.3m beyond the external walls and is open on two sides. Existing pavers fall away from the external walls.

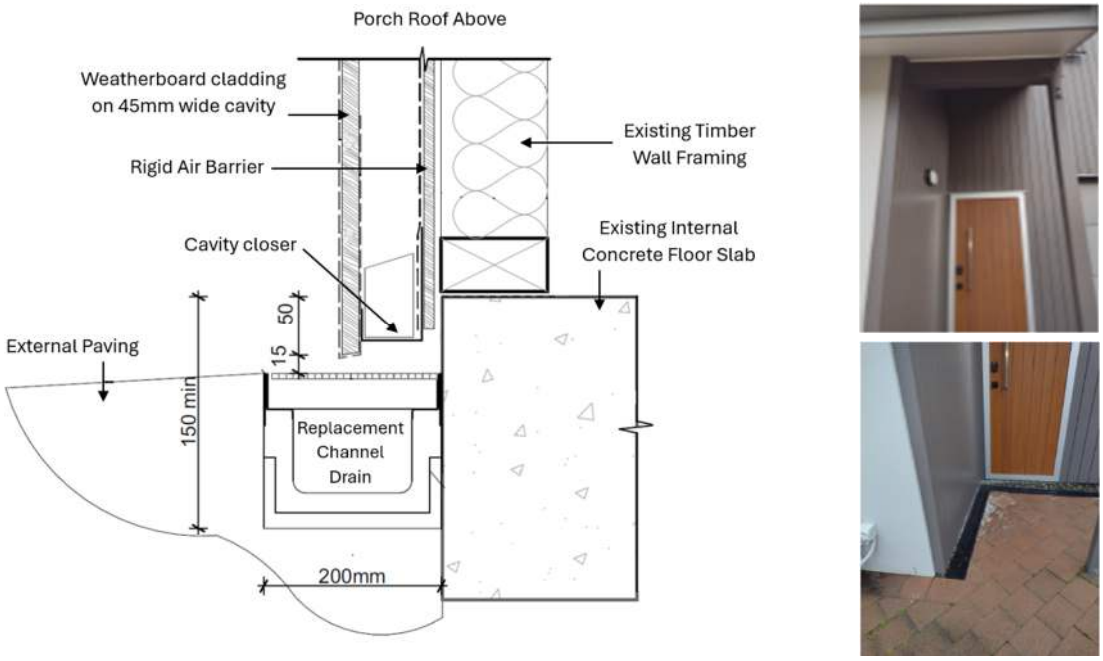


Figure 3: Detail 3 – proposed cladding and channel drain detail (not to scale) and photos of front entrance porch and existing drain

3. Background

3.1. The authority granted building consent BCO10303799 on 18 April 2020 for alterations to the dwelling, including recladding to change the existing direct-fixed horizontal timber weatherboards to vertical weatherboards on a cavity, with areas of existing brick masonry to remain in place. The consented plans indicated that a new nib wall was to be added to the concrete slab floor at the northeast end of the rear garage and along the eastern side of the back of the dwelling (see Plan 1). The specifications were accompanied by a CodeMark certification for the cladding product that was current at the time.

3.2. The installation details for the replacement cladding, approved in the building consent plans and specifications, referenced Acceptable Solution E2/AS1 *External Moisture* ("E2/AS1")[5], with minimum cladding clearances indicated between the

[5] Acceptable Solution E2/AS1, 3rd ed., amendment 9 (effective from 27 June 2019 to 3 November 2020)

cladding and the paved ground being as per the Acceptable Solution. The approved plans indicated an existing channel drain along the northeast elevation of the rear garage (in the location of Detail 1), but do not show the cladding terminating above the channel drain.

3.3. The proposed replacement channel drain in Detail 3 was not specified in the consent, rather was an inclusion following the authority's inspection. The replacement channel connects to an existing channel across the threshold of the front garage.

3.4. Work started, and included various inspections, with the authority conducting a final inspection on 5 May 2023, which was recorded as a "fail, due to ground clearances not as per the consented plan".

3.5. The final inspection sheet contained a suggestion that the owner submit the proposed and as-built details which differed from the consented plans and specifications to the authority for "…technical review and if satisfied [with compliance with the Building Code]…" a minor variation approval as an alternative solution would be considered. It is these details which are the subject of this determination.

3.6. The authority received these details on 28 May 2023, but on 19 June 2023, refused to approve the details as an alternative solution. It did not consider enough information had been supplied to enable it to be satisfied that the details, with the reduced ground clearances, complied with clause E2. In particular, the authority was concerned that the "…proposal has no substantial information proving a compliance pathway as either a verification method or alternative solution apart from statements from the technical team [being] information from overseas forwarded to you from the [product] supplier".[6] The authority made no mention of whether it considered the details complied with B2.

4. Discussion

4.1. The matter to be determined is whether Details 1, 2, and 3, as described in paragraphs 2.4 to 2.6, comply with E2 *External Moisture* and B2 *Durability*. Details 1 and 2 have been constructed on two elevations of the rear garage. Detail 3 is proposed for the external walls adjacent to the front entrance, where an existing channel drain is to be replaced.

4.2. In all three details, the dispute between the parties is the clearance between the bottom edge of the cladding and the paved ground or channel drains below.

4.3. It is important to note that, while the particular aspect of the cladding that is in dispute is the clearance at the bottom of the cladding, it is the cladding system in its

[6] The authority also referred to requirements in a BRANZ appraisal. However, while the appraisal covered a similar cladding system, it did not cover the product installed on the owner's dwelling.

entirety that must comply with the Building Code, and this will depend on a broader range of factors than just the clearances in each location. I note the designer, who is acting on behalf of the owner in this determination, did not make a submission about how they believe the cladding system as a whole will comply with the Building Code.

Establishing compliance with the Building Code

4.4. Section 17 requires all building work must comply with the Building Code to the extent required by the Act.

4.5. Section 19 details the various ways that compliance can be established, including the various methods that a building consent authority must accept as establishing compliance, such as Acceptable Solutions, Verification Methods, and current registered product certificates for a building product or system (ie CodeMark Certificates). However, these methods are not the only ways that compliance can be established, and it is open to a building consent applicant to propose an "alternative solution" to establish compliance.

4.6. For an alternative solution, evidence must be provided to demonstrate how the building work complies with the relevant performance criteria of the Building Code. Previous determinations[7] have discussed the types of evidence that can be considered, and this can include a comparison of the features and functions of the proposed alternative solution against an Acceptable Solution, together with an assessment of how any differences might be expected to affect compliance.

4.7. As part of the building consent for replacement of the cladding system on the owner's dwelling, the specifications and CodeMark referenced details from E2/AS1 to demonstrate overall compliance of the replacement cladding, including the clearances. However, a system incorporating vertical timber weatherboards over a cavity is outside the scope of E2/AS1 due to "the need for horizontal battens, which if solid, would interfere with the *drained cavity*".[8]

4.8. In terms of the ground clearances, the consented cladding system specifications stipulate the clearances were to be no less than 100mm to paved ground, in accordance with E2/AS1. However, the designer has confirmed the distance between the bottom edge of the cladding and the paved ground or grate of the channel drain below is 15mm to 20mm, depending on the detail in question, which does not conform with the specifications nor E2/AS1.

4.9. Channel drains are used to collect surface water and direct it to another part of the stormwater system, with the grate on top installed level with the surrounding ground and to allow for access for maintenance. E2/AS1 details the use of channel

[7] See for example, *Determination 2025/027 The refusal to grant an amendment to a building consent to include external wall claddings terminating in channel drains* (6 June 2025) at [4.16].

[8] E2/AS1 3rd ed., amendment 10, effective from 5 November 2020) at [9.4.1.2] and the supplementary comment limits section 9.4 *Timber Weatherboards* to direct-fixed vertical weatherboards.

drains in front of external doors to form a level threshold into a building but it does not include channel drains used below cladding.

4.10. Accordingly, it is necessary to assess the compliance of the cladding system with clauses E2 and B2 as an alternative solution. The cladding system is made up of building elements[9] that include the acetylated timber weatherboards, the treated timber cavity battens, the rigid air barrier used as the wall underlay, the cavity closers, and stainless-steel fixings.

What compliance with clause B2 and E2 requires

4.11. The clauses of the Building Code that are in dispute are clauses E2 *External Moisture* and B2 *Durability*. The clauses are linked in that the functional requirement of clause B2 requires sufficient durability of materials, components and construction methods to satisfy the other functional requirements of the Building Code throughout the life of the building without reconstruction or major renovation.

4.12. Turning first to clause B2, the building work is required to comply with the performance criteria, which in this case is B2.3.1, and by doing so, the functional requirement B2.2 will be met. The requirement of performance criteria B2.3.1 is:

> **B2.3.1** Building elements must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the specified intended life of the building, if stated, or… [a specified durability period in subclause (a), (b) or (c) that applies to the building element]

4.13. Subclauses (a), (b) and (c) then set out the minimum durability periods for different types of building elements, being 5, 15 or 50 years. The variance in the durability periods depend on the nature and function of the building elements, including how easy the building elements are to access, replace and maintain and whether failure to comply would go undetected during normal use and maintenance.

4.14. Generally speaking, external cladding must perform for the minimum durability period of 15 years, as primary building elements that form the system are moderately difficult to access or replace. Building elements that are difficult to access or replace, or where failure to comply would go undetected during both normal use and maintenance must perform for the life of the building, being not less than 50 years (or for the specified intended life).

4.15. The relevant performance criteria in clause E2 that the cladding system must meet are set out in E2.3.2, E2.3.3 and E2.3.5:

> **E2.3.2** Roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to *building elements*, or both.

[9] 'Building elements' is defined in clause A2 *Interpretation* of the Building Code as any structural and non-structural component or assembly incorporated into or associated with a building.

> **E2.3.3** Walls, floors, and structural elements in contact with, or in close proximity to, the ground must not absorb or transmit moisture in quantities that could cause undue dampness, damage to *building elements*, or both.
>
> **E2.3.5** *Concealed spaces* and cavities in *buildings* must be constructed in a way that prevents external moisture being accumulated or transferred and causing condensation, fungal growth, or the degradation of *building elements*.

4.16. The objective of E2 is to safeguard people from illness or injury that could result from external moisture entering a building, with the functional requirement of E2.2 requiring buildings to be constructed in a way that provides adequate resistance to penetration by, and the accumulation of, moisture from the outside.

4.17. The terms "undue dampness" and "damage" in clauses E2.3.2, and E2.3.3 are not defined in the Act or Building Code. However, the meanings of these terms have been considered in determination 2014/062[10] and I agree with the reasoning that determination applied. In particular, I consider the following points are of relevance to this determination.

4.17.1. The term "undue dampness" indicates a level of moisture that has, or will, result in detrimental effects on building elements, or a building's occupants, or both.

4.17.2. There is no requirement for damage to have occurred before the test for undue dampness can be satisfied. A non-compliance with of clauses E2.3.2 and E2.3.3 can arise from either undue dampness **or** damage to building elements, it does not require both (my emphasis).

4.17.3. Building elements, such as structural members forming the wall framing, must be protected from the effects of undue dampness in order to achieve their required durability periods.

4.17.4. Occasional or intermittent moisture ingress through a building's external envelope does not necessarily mean there has been a failure to comply with clause E2.3.2. Where the level or frequency of moisture ingress is low, or where there is sufficient drainage and drying capacity in the cladding system, the moisture may not cause undue dampness or damage. However, building elements exposed to moisture may be detrimentally affected by continuous wetting and drying cycles or prolonged periods of elevated moisture levels.

4.17.5. Where damage does occur, even if it is discrete or localised, the fact that there has been moisture ingress to the level that it has caused undue

[10] *Determination 2014/062 Regarding the refusal to issue a code compliance certificate and the issue of a notice to fix for a an 11-year-old house with mixed claddings at 20 Ian Sage Avenue, Torbay, Auckland* (issued 17 December 2012), at paragraph 8.3.

dampness or damage to a building element means that there has been a failure to comply with clause E2.3.2.

4.18. In addition to the requirements in clauses E2.3.2 and E2.3.3, clause E2.3.5 requires that concealed spaces and cavities in buildings should be constructed in a way that prevents moisture accumulating to a level which causes condensation, fungal growth or degradation of building elements.

4.19. The cladding system for the owner's building incorporates a drained cavity[11]. A drained cavity assists drying by allowing water which occasionally penetrates the wall cladding to drain to the exterior of the building, and any remaining moisture to dry by evaporation.

4.20. While the owner's submissions have focussed on the durability of the cladding product in relation to the distance between the bottom edge of the cladding and the ground level or top of the channel drain below, as stated in paragraph 4.3 I must consider the compliance of the cladding system as a whole with both clause E2 and B2.

4.21. The effectiveness of drained cavities depends on a number of factors, including the degree of air movement (ventilation), properties of the incoming air such as moisture content and humidity, and wall orientation and permeance of the materials. Drained cavities can both remove and introduce moisture depending on the humidity of the incoming air and the climate conditions. Moisture removal is effective when the ventilation air is drier than the cavity air and the cavity's internal surfaces.

The compliance of the three cladding details

4.22. The designer has provided a copy of the specifications and the new CodeMark (2024).[12] In relation to the clearance of the cladding, the owner considers Details 1 and 3 comply with clause B2 by way of the Acceptable Solution and that the details "[do] not strictly comply with E2/AS1" but comply with E2 as an alternative solution. They believe "the result is a significant upgrade of the existing cladding performance and durability, despite evidence of in-life service performance in excess of 15 years by the existing cladding".

4.23. The three details have some features in common, which I consider together below before turning to their individual aspects. Most notably the function of the cladding system is the same across the details, in that any water on the face of the cladding

[11] 'Drained cavity' is not defined in either the Act or Building Code, but is described in E2/AS1 as "A cavity space, immediately behind a wall cladding, that has vents at the base of the wall. Also known as a drained and vented cavity and referred to in [the] Acceptable Solution as a cavity or drained cavity."

[12] A new CodeMark certificate for the cladding system was issued in July 2024, relating to the installation manual of 2021. This installation manual post-dates the manual for the CodeMark provided with the building consent in April 2020.

and moisture that enters the cavity will drain off and out the bottom of the cladding into the channel drain or onto the ground below.

4.24. The top of the cladding in all the locations has been closed in line with the manufacturer's requirements and as is commonly done for weatherboard cladding. The cavity is partially closed at the bottom by a proprietary cavity closer with ventilation openings to allow for airflow. In all locations, the details show reduced clearances between the bottom edge of the cladding and the channel drain or paved ground below, compared to clearances in E2/AS1.

4.25. The significance of the reduced clearance is the effect on the cladding systems ability to dry out. Drying is primarily through ventilation and evaporation to remove moisture from the cavity that has not already been removed by drainage. The closer the edge of the cladding is to the ground, the less airflow and ventilation will be provided to the cavity behind. Ground moisture levels and adjacent absorbent materials mean humidity levels are higher closer to the ground, which requires sufficient airflow and ventilation to compensate.

4.26. In this case, the plans show the cavity is 45mm wide.[13] At this width, it would be expected that the ventilation openings in the proprietary cavity closers are also larger than standard, allowing increased airflow. However, this will be offset by a reduced area for air movement and greater humidity around the base of the cladding due to the proximity to the channel drain and/or paved surface below.

4.27. The external cladding product used is the same in all three detail locations, and the bulk of the owner's submissions have concerned the durability of the cladding weatherboard. The weatherboards are made of an acetylated timber, which the owner considers will exceed the 15-year durability period required by clause B2. The owner's opinion is based on the product performance testing summary undertaken by the product manufacturer and the product installation manual, which states that the cladding system "is expected to have a serviceable life of at least 50 years in above ground applications".[14]

4.28. The acetylation process uses a vinegar-style solution to alter the cellular structure of the timber and thereby reduce its ability to absorb and transmit moisture. As a result, the timber becomes less susceptible to rot.

4.29. No submissions have been made by the parties as to how the cut ends of the cladding product are to be treated. However, I consider that if this element of the cladding is completed in accordance with the specifications in the installation

[13] Based on the designer's comments and consented plans, the cladding system is 45mm. However, I note the specifications indicate the cavity battens measure 45mm wide x 20mm thick, which would result in a 20mm cavity.

[14] The owner supplied copies of both documents, including two versions of the product installation manual dated 2017 and 2025, during the determinations process. They noted that the performance testing summary and the 2017 installation manual were valid at the time that the building consent application was made. The owner also supplied a copy of the new 2024 CodeMark certificate.

manual, and based on the evidence of weatherboard treatment, the acetylated timber weatherboards will not decay and will meet the durability requirement in clause B2, despite being installed in close proximity to the ground surface (be that a paved surface or the grates of the channel drains).

4.30. The cladding will also protect the cavity from water and moisture ingress through the weatherboards and creates a drip edge for any water on the face of the cladding to run off at the bottom. The low ground clearances at the bottom of the cladding also provide additional deflection protection for the cavity by shielding it from splashes of water off the paved ground surfaces.

4.31. However, the treatment of the cladding product and permeance is also a factor affecting the cladding system's drying performance, limiting the diffusion of moisture through the building material that would otherwise assist in dispersing moisture within a cavity.

4.32. Another aspect of the cladding system that all three details have in common is the castellated cavity battens. These battens have been installed horizontally to accommodate the vertical weatherboards and have grooves or castellations along their length to allow the cavity to drain should any moisture enter it and for drying of any of that remaining moisture. In this regard, I am satisfied that any water that does enter the cavity will be able to drain out.

4.33. In the following paragraphs I consider the individual details, comprising the features described above as well as features that differ between them.

Compliance of cladding Detail 1

4.34. Detail 1 describes how the cladding system has been constructed on the northeast elevation of the garage, which has no overhanging eaves and is above an existing channel drain. The drain is 150mm wide and 150mm deep, with a grate on top of it. The adjacent ground is primarily paved, although there is also a short section of garden next to the northern end of the drain and beneath the cladding. The bottom of the cladding terminates 20mm above the grate of the channel drain.

4.35. In their submissions, the owner noted the existing garage is not a 'habitable space'[15] and made the following comments about Detail 1.

4.35.1. The new nib wall beneath the bottom plate maintains the 150mm clearance to paved ground, as specified in E2/AS1, without the channel drain and "a clearance of more than 150mm is achieved from the base of the channel [drain]".

[15] 'Habitable space' is defined in Clause A2 as a space used for activities normally associated with domestic living, but excludes any bathroom, laundry, water-closet, pantry, walk-in wardrobe, corridor, hallway, lobby, clothes-drying room, or other space of a specialised nature occupied neither frequently nor for extended periods

4.35.2. "The open channel [drain] grate directly below the cladding ensures that water will not be ponding directly below the cladding". In the owner's view, this is similar in detailing to situations where cladding terminates above a deck (timber or membrane) or a membrane roof.

4.36. I agree with the owner that the height of the nib wall in this location provides protection for the wall framing and the bottom edge of the rigid air barrier by increasing the clearance between them and the channel drain, which contributes to compliance with clause E2.3.3.

4.37. However, I do not agree with the owner's assessment of how the channel drain and cladding system will function in this location.

4.38. The area surrounding the channel drain is primarily paved ground which, in the photos provided, does not show any fall away from the garage. The channel drain will therefore be collecting and disposing of water from the paved surface as well as from the cladding.[16] In this location the external wall is also exposed with no eaves.

4.39. The channel drain is shown to have a fall of 1:200, which provides a shallower fall and over a significantly longer length (6m) than provided for in the Acceptable Solution (where a maximum length of 3.7m is specified). The length and fall in this location increase the risk of ponding within the drain.

4.40. In my opinion, these aspects of the construction of Detail 1 means there will be increased moisture levels within the channel and higher levels of humidity around the base of the cladding system. This is due to the channel collecting moisture from both the cladding and paved surface, as the channel drain is the primary surface water disposal system for the surrounding ground, coupled with the length and fall of the drain.

4.41. The increased moisture levels are also likely to be exacerbated by additional humidity from the adjacent concrete paved ground. Also, although the drainage channel grate can be removed for maintenance purposes, as is apparent in the evidence provided, the limited clearance between the grate and the cladding leads to a build-up of debris between the channel drain grate, which requires increased maintenance (ie monitoring and removal) to prevent further reduction in ventilation and increased humidity.

4.42. I acknowledge that the orientation, treatment levels, and the nib wall will all contribute to the performance of the cladding system and durability of the building elements. However, due to a combination of the features in this location, I consider that there is a higher likelihood of elevated moisture in the cladding system effecting its drying capacity along this elevation, with a resulting increase in the risk of condensation and accumulation of moisture. The owners have not provided any

[16] A portion of the northern end of the channel drain is adjacent to a garden, which is lower than the grate on the channel drain, so along this section the channel drain would only be collecting water from the cladding.

submissions about how they expect the cladding system will manage this increased moisture within the cavity.

4.43. I consider the lack of information about how the cladding system is to manage the levels of moisture within the cavity that would result in moisture being accumulated or transferred and causing condensation, fungal growth or the degradation of building elements means compliance with clauses E2.3.2 and E2.3.5 has not been demonstrated for the constructed section of the cladding system along the northeast elevation of the rear garage described in Detail 1.

Compliance of cladding Detail 2

4.44. Cladding Detail 2 applies to the construction of three sections of external cladding between 500 and 700mm wide at the sides and between the rear garage doors on the northwest elevation.[17]

4.45. Similar to Detail 1, air movement around the bottom of the cladding system is reduced and will affect the cladding system's ability to dry out through ventilation and evaporation.

4.46. Where Detail 2 differs is in respect of its location and where the base of the cladding terminates, notably the fall on the driveway and the 600mm wide eaves of the garage above.

4.47. In their submissions, the owner noted the existing garage is not a habitable space and made the following comments about Detail 2:

4.47.1. The length of cladding with reduced clearance to the paved ground is short.

4.47.2. "It is impractical to achieve the [E2/AS1] threshold [of 100mm in this location] … when the existing single garage doors are closely spaced together".

4.47.3. The eaves above the cladding, being 600mm deep, provide cover for the area.

4.47.4. There is a "good fall away from the building in the existing concrete drive[way]" and the storm water sump and garden adjacent to the paved area ensure there is "no ponding adjacent to the cladding".

4.48. I agree that the slope of the driveway in front of the cladding and garage doors will move surface water away from the base of the cladding. This will lessen humidity by reducing the ability of water to pond below the cladding. Drainage is also enhanced by the presence of the two stormwater sumps in front of (but not directly below)

[17] The owner has only referenced one area where there is a short length of cladding ("0.5m max") between the vehicle openings. However, photos provided show two other lengths at either end of the vehicle openings which also have similarly close cladding clearances to the paved driveway.

the central and eastern sections of cladding, and the garden below part of the western section (with a greater clearance to the bottom edge of the cladding).

4.49. The 600mm eaves above the cladding and the single storey height of the garage provide deflection and cover for the cladding, meaning less surface water in this location when compared with Detail 1 along the northeast elevation.

4.50. Given the factors in this location, in particular those that support the cladding's deflection and drainage away from the cladding system, I consider that the risk of moisture transfer or accumulation in the cavity as condensation, and of this leading to undue dampness and fungal growth is low. I therefore consider that the construction of the cladding system on the northwest elevation of the rear garage described in Detail 2 will achieve compliance with clauses E2.3.2, E2.3.5.

4.51. I also note that the bottom plate for the external walls along this northwest elevation, which is within 60mm (approximately) of the paved ground, is an existing building element. Section 112 of the Act concerns the compliance of alterations to existing buildings, with section 112(1)(b) providing that (in essence) the building must continue to comply to the same extent it did before the building work was carried out.

4.52. The bottom plate will remain the same distance from the ground that it was before the new cladding was installed, and the cover provided to the bottom plate by the cladding will be the same, if not more, than previous. I have also concluded that the cladding system will achieve compliance with clauses E2.3.2 and E2.3.5. I conclude therefore that in regard to the bottom plate the building will continue to comply with clause E2.3.3 to the same extent as it did before the building work was carried out. I note moisture testing undertaken in this location by the owner does not indicate that there have been any issues with moisture ingress to the external walls, either before or after the building work was carried out (to the point in time when the testing was undertaken).

Compliance of cladding Detail 3

4.53. Cladding Detail 3 proposes the construction of the cladding system on the external walls of the southwest side of the dwelling, adjacent to the front entrance, and replacement of a channel drain below the cladding.[18]

4.54. The channel drain will be 200mm wide and 150mm deep, replacing the existing smaller one (150mm wide by 150mm deep). The drain consists of two sections at right angles to each other with falls of 1:100. The drain will run immediately below the cladding, with the clearance between the bottom of the cladding and the grate on top of the channel drain being 15mm. It is then proposed to connect to another existing channel drain that runs along the opening of the front garage, with the

[18] The existing channel drain in this area has been constructed away from the cladding. The proposed detail shows the new channel as being installed directly beneath the cladding system.

same fall, which in turn connects to a sump that discharges to the storm water system. The ground adjacent to the drain is paved.

4.55. In their submissions, the owner made the following comments about Detail 3:

4.55.1. The location of the cladding and channel drain is covered and protected by the entry porch above "ensuring that the channel drain will largely remain dry, only becoming temporarily wet in wind driven rain events".

4.55.2. The distance between the bottom of the channel drain and the timber bottom plate of the wall framing will be 150mm, which meets the minimum clearance requirement shown in Figure 17B of E2/AS1 (which concerns channel drains at level thresholds) and will be greater than the clearance currently being achieved in this location.

4.55.3. The channel drain will only run beneath the proposed cladding for a maximum length of 1400mm.

4.56. I agree with the owner that the location and cover to the area in which Detail 3 is located are significant factors in considering compliance of the cladding system. The areas of cladding are largely sheltered by the entry porch overhang above, which means there is minimal risk of significant amounts of water contacting the cladding system. In turn, the risk of moisture entering the cladding cavity through gaps and cracks beyond what is able be handled by drainage and drying is low.

4.57. The design of the channel drain is proposed to have a smaller capacity and to meet the fall of 1:100 set out in E2/AS1. The drain would not collect significant amounts of water in this location where the cladding and adjacent paving are sheltered, and I consider the risk of increased humidity that could affect the drying performance of the cavity is low.

4.58. While there is a limited area of cladding (approximately 500mm wide) to one side of the front door that is not covered by the porch roof, I consider the size and location of this area make it unlikely that the proposed construction will lead to condensation in the cavity and in turn, fungal growth or undue dampness or damage.

4.59. As with Detail 2, the existing timber bottom plate within the wall framing is in close proximity to the outside ground, being 75mm from the top of the channel grate in Detail 3. However, given the location of the external walls protected by the porch above and my conclusions that the channel drain is unlikely to collect or hold significant amounts of water, the risk of moisture being present in the cladding system cavity to a level which may cause fungal growth and undue dampness in this area is low and I consider the timber wall framing is protected from being exposed to moisture of a level that could cause undue dampness or damage.

4.60. I therefore consider that the proposed construction of the cladding system on the southwest elevation around the front entrance described in Detail 3 will comply with clauses E2.3.2, E2.3.3, and E2.3.5 as an alternative solution.

5. Decision

5.1. In accordance with section 188 of the Building Act 2004, I determine:

- compliance with clauses E2.3.2 and E2.3.5 has not been demonstrated for the as-built section of the cladding system along the northeast elevation of the rear garage described in Detail 1
- the as-built cladding system terminating above paved ground adjacent to the rear garage doors on the northeast elevation described in Detail 2 complies with clauses E2 and B2
- the proposed Detail 3 for the cladding system terminating above a channel drain at the front entrance of the dwelling complies with clauses E2 and B2.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 25 September 2025.

Peta Hird

Lead Determinations Specialist